

Source mechanism of a very long-period event that occurred at Mt. Ontake on January 25, 2007

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Intense seismic activity just beneath the summit of Mt. Ontake started since the end of December 2006. Volcano tectonic (VT) earthquakes intensively occurred during the beginning to the middle of January 2007. Low-frequency earthquakes occurred and the daily number of VT earthquakes gradually decreased since the middle of January 2007. Volcanic tremors had been observed since the end of January 2007. A small eruption occurred late March 2007. A volcanic tremor associated with a very long-period (VLP) event on January 25, 2007. Waveforms of the VLP consist of very long-period (20-80 s) signals. Assuming possible source geometries, we applied a frequency domain waveform inversion method (Nakano & Kumagai, 2005; Nakano et al., 2006) to the observed waveforms of the VLP event. Displacements of three broadband stations of Nagoya University, seven Hi-net stations and one F-net stations can be used to do the inversion. Our inversion analysis points to volumetric changes of a vertical crack as the VLP source, which is located at a depth of 1 km above sea level beneath the summit and close to a pressure source obtained by GPS observations. The vertical crack source has the N20W-S20E long-axis, which is consistent with the direction of dike sources by GPS observations. We interpret the VLP event as the gas-release process and the resonance of the crack.